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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,542	02/27/2004	Jennifer L. West	1789-03506	9465
23505	7590	09/22/2004	EXAMINER	
CONLEY ROSE, P.C. P. O. BOX 3267 HOUSTON, TX 77253-3267			COUNTS, GARY W	
			ART UNIT	PAPER NUMBER

1641

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/789,542

Applicant(s)

WEST ET AL.

Examiner

Gary W. Counts

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: Under the section entitled Cross-Reference To Related Applications. The application discloses that this application is a divisional application of U.S. Patent Application No. 09/616,154. However, after reviewing the current application (10/789,543) and parent application 09/616,154, it appears that the current application (10/789,543) should be a CIP of 09/616,154 because neither the current application nor the parent application disclose the limitation is less than the bulk electron mean free path of the material. Therefore, the priority date for Application 10/789,543 is considered to be 02/27/2004 since the parent Application (09/616,154) does not contain the limitations as claimed in the current application.
2. Also, The current status of U.S. Patent Application No. 09/616,154 and U.S. Patent Application No. 09/038,377 have not been disclosed.

The status of nonprovisional parent application(s) (whether patented or abandoned) should also be included. If a parent application has become a patent, the expression "now Patent No. ____" should follow the filing date of the parent application. If a parent application has become abandoned, the expression "now abandoned" should follow the filing date of the parent application. For example, U.S. Patent Application No. 09/616,154 now Patent No. 6,699,724.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, lines 5 & 6 the phrase "bulk electron mean free path of the material" is vague and indefinite. It is unclear what Applicant is referring to or what Applicant intends. There is no definition or guidance provided for the phrase in the specification.

Claim 1 the recitation "the material" is vague and indefinite because there is insufficient antecedent basis for this limitation. What material is applicant referring to?

Claim 12 the recitation "said wavelength that is maximally absorbed or scattered" is vague and indefinite. There is insufficient antecedent basis for this limitation.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. For the purpose of art rejections the priority date has been designated as February 27, 2004 because the parent application 09/616,154 filed July 14, 2000 does not contain the limitation the shell layer is independent of the radius of the inner layer and is less than the bulk electron mean free path of the material. Therefore, the priority date of the parent has not been granted.

7. Claims 1, 16, 17 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Oldenburg et al. (Infrared extinction properties of gold nanoshells, Applied Physics Letters, Vol. 75, No. 19, Nov. 1999, pgs, 2897 – 2899).

Oldenburg et al disclose nanoparticles comprising gold shells with silica cores. Oldenburg et al disclose that the thickness of the shell is independent of the radius of the core (inner layer).

With respect to the recitation wherein the thickness of the shell layer is independent of the radius of the inner layer and is less than the bulk electron mean free path of the material as recited in the instant claims. Since Oldenburg et al disclose the same nanoparticles comprising the same core and same shell as the instantly recited claims, Oldenburg et al anticipates the claims.

8. Claims 1-10, 13 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Schultz et al (US 6,180,415).

Schultz et al disclose resonant scattering particles comprised of a dielectric core (non-conducting) and an outer shell comprised of gold or silver (col 5, lines 14-15 and col 10, lines 1-5). Schultz et al disclose that these particles may be used in diagnostic applications. The particles have surface-attached ligands adapted to bind to ligand-

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binding sites on a target. Schultz et al disclose that the ligands are one of the members of a conjugate part that can include antigen/antibody, enzyme/substrate. Schultz et al disclose that different surface localized molecules may be different ligands effective to bind to different ligand-binding sites. Schultz et al also disclose that the particles have a spectral emission wavelength in one of three ranges >700 nm, 400-700 nm and <400 nm. (col 23, lines 1-61). Schultz et al disclose that these particles can be tuned to a desired frequency (col 32, lines 41-52). Schultz et al disclose that these particles are capable of inducing surface enhanced Raman scattering (col 49, lines 1-50). Schultz et al disclose that these particles are immobilized to a substrate (support) and the optical scattering parameters of each particle are recorded (col 44, lines 9-17). Schultz et al also disclose that the substrate may be nitrocellulose (permeable material). Schultz et al also disclose that these particles can be arrayed on a support such as glass. Schultz et al disclose that these particles can be used in sandwich, direct and indirect assays (see examples).

With respect to the thickness of the shell layer is independent of the radius of the inner layer as recited in the instant claims. Schultz et al disclose that the particle can be spherical and gives a range for the thickness of the shell. Therefore, Schultz et al teaches a particle wherein the thickness of the shell layer is independent of the radius of the inner layer. Further, the instant claims are directed to a particle and regardless how the particle is made, as long as the particle has a metal shell thickness and a non-conducting inner layer, Schultz et al anticipates the claims.

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With respect to the wherein the thickness of the shell layer is independent of the radius of the inner layer and is less than the bulk electron mean free path of the material as recited in the instant claims. Since it is unclear what the phrase means and unclear what is being done (see 112 2nd rejection above), and further, since Schultz et al disclose the same particle as recited in the instant claims, Schultz et al anticipates the claims.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 11, 12, 14, 15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schultz et al in view of Birnboim et al (US 5,023,139).

See above for teachings of Schultz et al.

Schultz et al differ from the instant invention in failing to teach the inner layer comprises silicon dioxide.

Birnboim et al disclose particles comprising a non-conducting inner layer (silica) surrounded by a metal shell (gold) (col 1, lines 59-68) (claims 1, 11, 13). Birnboim et al disclose that by altering the shell thickness of the particles that they can be tuned from ultraviolet to infrared range of the electromagnetic spectrum. These particles provide for nonlinear optical materials which result in an increased polarization.

It would have been obvious to one of ordinary skill in the art to incorporate silica as taught by Birnboim et al into the particles of Schultz et al because Birnboim et al show that this material provides for particles that provide for nonlinear optical materials which result in an increased polarization.

With respect to the particles substantially matches the wavelength of light emitted from a predetermined source of the radiation. Since the combination of Schultz et al and Birnboim et al disclose the same non-conducting inner layer and same metal shell as recited in the claims. It would have been obvious to one of ordinary skill in the art that the wavelength of light that is maximally absorbed or scattered by the particles

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substantially matches the wavelength of light emitted from a predetermined source of radiation.

With respect to the wavelength absorbance or scattering wavelength maximum as recited in the instant claims. Since the combination of Schultz et al and Birnboim et al disclose the same non-conducting inner layer and same metal shell as recited in the claims. And because Schultz et al specifically teaches that the particles have a spectral emission wavelength in one of three ranges >700 nm, $400-700$ nm and <400 nm. (col 23, lines 1-61). It would have been obvious to one of ordinary skill in the art that the maximum absorbance or scattering wavelength maximum would fall within the recited ranges.

13. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schultz et al in view of Sarkar et al (Plasmon Resonance Shifts of Au-coated Au_2 Nanoshells: Insight into Multicomponent Nanoparticle Growth, The American Physical society, June 1997 pgs 4217-4220).

See above for teachings of Schultz et al.

Schultz et al differ from the instant invention in failing to teach the particle has an inner layer of gold sulfide and a shell of gold.

Sarkar et al disclose particles that are comprised of a gold sulfide core (inner layer) and a gold shell. Sarkar et al disclose that the gold nanoshells possess quite remarkable optical properties that differ dramatically from those of solid gold nanoparticles and that these particles provide for unique redshifting of the nanoparticle plasmon resonance to wavelengths in the visible and near infrared spectrum (page 4217).

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It would have been obvious to one of ordinary skill in the art to incorporate a gold sulfide core and a shell of gold as taught by Sarkar et al for the particles of Schultz et al because Sarkar et al shows that these gold nanoshells possess quite remarkable optical properties that differ dramatically from those of solid gold nanoparticles and that these particles provide for unique redshifting of the nanoparticle plasmon resonance to wavelengths in the visible and near infrared spectrum.

With respect to the specific particle diameters, inner layer diameters and shell thickness as recited in the claims. The optimum condition diameters and shell thickness can be determined by routine experimentation and thus would have been obvious to one of ordinary skill in the art. Further, it has long been settled to be no more than routine experimentation for one of ordinary skill in the art to discover an optimum value of a result effective variable. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum of workable ranges by routine experimentation." Application of *Aller*, 220 F.2d 454,456, 105 USPQ 233, 235-236 (C.C.P.A. 1955). "No invention is involved in discovering optimum ranges of a process by routine experimentation." *Id.* At 458, 105 USPQ at 236-237. The "discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." Application of *Boesch*, 617 F.2d 272,276, 205 USPQ 215, 218-219 (C.C.P.A. 1980).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11

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F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 52 of U.S. Patent No. 6,344,272. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one of ordinary skill in the art to use more than a single nanoparticle for an application of the nanoparticle.

Conclusion

14. No claims are allowed.

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Tarcha et al disclose a particulate having a surface capable of inducing surface-enhanced Raman light scattering and also having attached thereto a Raman-active label.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary W. Counts whose telephone number is (571) 2720817. The examiner can normally be reached on M-F 8:00 - 4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571)-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Gary Counts
Examiner
Art Unit 1641
September 13, 2004


LONG V. LE
SUPERVISORY PATENT EXAMINER
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09/17/04